CLASSIFICATION CONFIDENTIAL

CENTRAL INTELLIGENCE AGENCY

INFORMATION FROM FOREIGN DOCUMENTS OR RADIO BROADCASTS

50X1-HUM

COUNTRY USSR

SUBJECT Economic - Construction machinery

DATE OF INFORMATION 1949

DATE DIST. 14 Sep 1949

HOW PUBLISHED Monthly periodical

WHERE PUBLISHED Moscow

NO. OF PAGES 4

DATE PUBLISHED Jun 1949

LANGUAGE Russian

SUPPLEMENT TO REPORT NO.

THIS IS UNEVALUATED INFORMATION

SOURCE Stroitel'naya promyshlennost', No 6, 1949.

A NEW SINGLE-BUCKET TRACTOR-LOADER

Engr S. P. Yepifanov

Labor consumption in loading and unloading operations is 30 - 35 percent of the total labor consumption of all construction and erection operations.

Almost half of the construction loads (by weight) requiring transport are loose or fine materials. When the dirt and debris which must be hauled away from the construction sites is added to this, the amount of loose and fine materials is approximately 70 - 80 percent of the total volume of materials transported in construction.

Reduction in labor consumption of such operations by even one percent frees 25 - 30 men per million rubles invested in the yearly program.

Mechanization of 50 percent of all loading and unloading operations is specified by the Ministry of Construction of Heavy-Industry Enterprises for 1949.

In the last 2 years, production of certain loading machinery has been started at machine-building plants. Problems of mechanization of loading loose and fine materials are best solved by single-bucket tractor loaders.

The design for the first single-bucket loader for a ChTZ-65 tractor was worked out in 1945. In 1946 the same type of loader was planned for a KhTZ-NATI tractor in the sugar industry. Also, in 1946 the All-Union Scientific Research Institute of Hoisting- and Transport-Machine Building (VNIIPTMASh) worked out designs for a single-bucket tractor loader for the S-80 tractor. An improved design was made by one of the plants of the Ministry of Construction- and Road-Machine Building. The experimental model of this loader has been tested by a joint committee.

This loader is intended principally for loading loose and fine materials from piles into open freight cars of standard and narrow gauge and into trucks, and for making piles of these materials.

CLASSIFICATION CONFIDENTIAL CONFIDENTIAL

STATE	NAVY	NSRB	DISTRIBUTION
ARMY	AIR	FBI	

The loader is mounted on an S-80 tractor. The equipment consists of a bucket with twin telescoping shafts. When loading heavy materials or narrow-gauge cars, a detachable unloading chute is mounted on the loader. The chute guides the flow of the material and reduces the impact on the floor or bottom of the transporting equipment.

A special supporting roller is fastened on to the front of the frame to support the loader when it is in operation, and especially when removing the loaded bucket from the pile of material.

The bucket is made of welded steel plate, and steel teeth are bolted to its cutting edge. The holding capacity of the bucket is the volume of the prism, formed by a side wall of the bucket and the bucket's depth.

The capacity of the bucket is 4.5 cubic meters. In loading materials, the volumetric weight of which is less than, for example, sugar beets, the capacity of the bucket can be increased to 6 cubic meters by extending the side walls.

The bucket's twin shafts are hinged to the caterpillar frame near the divided axles. They move along arched guides. This reduces their "free" motion considerably (from the point of view of flexibility).

The shafts are of telescopic design which makes it possible to increase the height of the load from 4,000 to 4,800 millimeters.

Under construction conditions and for the usual stocks of loose materials, coal, etc., such depth is not required. Therefore, in series production, loaders must only be furnished with telescopic shafts in special cases.

Only a small number of loaders must be furnished with 6-cubic-meter capacity buckets, and then only as removable equipment.

The raising and lowering of the bucket is effected by the tractor motor through a power-selection box (with a reversing gear), a four-row roller bush chain, a worm reducer, and two spiral drums. The bucket is raised with the aid of two steel cables, two ends of which pass through special tightening devices and are fastened to the frame of the loader. The other two ends are fastened to a spiral drum.

The tightening devices function when the tautness of the cables is reduced in the process of loader operations.

The spiral sections of the drums aid uniform utilization of the required engine power.

After the bucket has been filled with material and removed from the pile the angle between the cables and the bucket shafts begins to increase and the pull in the cables correspondingly lessens. At this point the cable passes over from the cylindrical section of the drum to the spiral section, thereby increasing the speed of the reeling.

The loader is operated from the tractor cab which has the terminal switches for raising and lowering the bucket interlinked with the tractor steering controls.

Specifications of the loader are as follows:

Load-lifting capacity	4	tons
Capacity of bucket (normal)	4.5	cu m
Capacity of bucket with extended side walls	6	cu m
Width of bucket (inside)	2,720	mm
Unloading angle of the bucket	37	degrees

Maximum height of load into transporting equipment:

a. With chute	2,300	mm
b. Without chute	4,000	"
c. Without chute with an extended shaft	4,800	"
Total weight of loader with tractor	20	tons
Weight of hanging equipment (without chute)	8.6	"

3. Over-all dimensions with bucket in low position, without chute, and with shaft removed:

a. Length	7,000	mm
b. Height	3,900	"
c. Width	2,800	"
Length with lower bucket position, with chute, and with shaft removed	8,200	"
Same with shaft extended	9,000	"

Maximum height of loader with upper bracket position:

a. With shaft removed	6,000	mm
b. With shaft extended	6,800	"

With a 4-ton load the loader maintains stability with an incline of 7 degrees. With an empty bucket it climbs a grade of 25 degrees 24 minutes. On level ground with a load of 4 tons the loader turns around freely at any angle and maintains its stability.

The committee has rated the performance of the loader with different types of material and operations. The data on operations follows: (See page 4).

Diesel fuel (solar oil) consumption per hour of net operation is 6.58 kilograms, and consumption of lubricating oil is 0.307 kilograms; 63 and 2.94 grams, respectively, are consumed per 1 ton of material conveyed.

An AK-11 truck crane is used in erection and removal of the chute.

The committee has approved series production of the loader.

In completing work on a metallurgical plant, 250 freight cars of debris were removed. Approximately 2,000 man days were consumed in the loading of the cars. With the aid of the loader the work could have been accomplished in the course of 4 - 5 machine shifts requiring 20 - 25 man days.

Materials	Operation	Hauling distance (in meters)	Total Vol of Work (in tons)	Total No of Cycles	Net Operating Time (in hr)	Bucket-filling Coefficient According to Weight	No of Cycles per hr	Productivity (in ton/hr)
Loose earth of Class II	Conveying from pile to pile	25 - 30	8,512	2,132	78.0	0.9	31.6 50	109.1 183
Same	Loading from pile to truck	12 - 15	878	240	8.08	0.91	29.7	109
Granular slag	Same	12 - 15	590	180	6.25	0.82	28.8	95
Rubble	Conveying from pile to pile	25 - 30	740	238	6.40	0.78	36.8	115
Sand	Same	20 - 25	678	197	7.08	0.86	27.7	97
Crushed coal	Same	50 - 60	480	97	6.16	1.24	15.5	78
Same	Loading a gondola from a pile	30	60	14	0.5	1.07	28	120

- E N D -